

# CLAIMS

What is claimed is:

1. An analog speed-up and gain control system, comprising:  
a speed-up circuit that receives a gain control input signal from associated digital circuitry and generates a speed-up control signal in response to changes in the gain control input signal; and  
delay circuitry that receives the gain control input signal and outputs a delayed gain control signal according to the gain control input signal.
2. The system of claim 1, the speed up circuit further comprising:  
a differentiator that receives the gain control signal and provides a differentiated signal as a function of the gain control signal; and  
a pulse generator that generates the speed-up control signal based on the differentiated signal indicating a change in the gain control signal.
3. The system of claim 2, the speed-up control signal comprising a pulse of a fixed duration.
4. The system of claim 2, further comprising an amplifier operatively coupled between the differentiator and the pulse generator, the amplifier being operative to amplify the differentiated signal and provide a corresponding amplified signal to the pulse generator.
5. The system of claim 2, the pulse generator further comprising a monoshot oscillator.
6. The system of claim 1 in combination with a filter network, the filter network comprising at least one variable gain amplifier operative to amplify an input signal according to a gain selected based on the delayed gain control signal.

7. The combination of claim 6, the filter network further comprising at least one filter operatively coupled to receive the amplified signal from the amplifier, the associated filter having a filtering characteristic that varies based on the speed-up control signal.

8. The combination of claim 7, the filter comprising a high-pass filter.

9. The combination of claim 8, the filtering characteristic comprising a corner frequency of the high-pass filter.

10. The combination of claim 6 implemented as an analog section of a direct conversion receiver.

11. A direct conversion receiver, comprising:  
a variable gain amplifier operative to amplify an input signal derived from a radio frequency (RF) signal, the gain of the amplifier being adjustable based on a gain control signal from an associated digital system;  
a filter operative to filter an amplified signal of the amplifier and provide a filtered output signal; and  
a speed-up control system that generates a speed-up control signal in response to changes in the gain control signal from the associated digital system and, the speed-up control system providing the speed-up control signal to the filter to adjust filter characteristics of the filter.

12. The system of claim 11, the speed-up control system further comprising:  
a differentiator that differentiates the gain control signal and provides a corresponding differentiated signal; and  
a pulse generator that generates a pulse signal in response to the differentiated signal so as to indicate a change in the gain control signal.

13. The system of claim 12, the speed-up control signal comprising the pulse signal, the pulse signal having a fixed duration.

14. The system of claim 12, further comprising an amplifier operatively coupled between the differentiator and the pulse generator, the amplifier being operative to amplify the differentiated signal and provide a corresponding amplified signal to the pulse generator.

15. The system of claim 12, the pulse generator further comprising a monoshot oscillator.

16. The system of claim 11, further comprising a delay system operative to impose a delay associated with changes in the gain control signal and provide a corresponding delayed gain control signal to adjust the gain of the variable gain amplifier.

17. The system of claim 16, the delay system comprising a low pass filter.

18. An analog speed-up control system for a direct conversion receiver, comprising:

a differentiator that receives a gain control signal from associated digital controls and provides a differentiated signal as a function of the gain control signal; and

a pulse generator that generates the speed-up control signal based on the differentiated signal so as to control a filter characteristic of at least one associated filter.

19. The system of claim 18, the speed-up control signal comprising a pulse of a fixed duration.

20. The system of claim 18, further comprising an amplifier operatively coupled between the differentiator and the pulse generator, the amplifier being operative to amplify the differentiated signal and provide a corresponding amplified signal to the pulse generator.

21. The system of claim 18, the pulse generator further comprising a monoshot oscillator.

22. A method for implementing speed-up mode control for an analog portion of a direct conversion receiver based on an input gain control signal provided by an associated digital portion the receiver, the method comprising:

- differentiating the input gain control signal to provide a differentiated signal;
- generating a speed-up control signal based on the differentiated signal indicating a change in the input gain control signal; and
- controlling a filter characteristic of at least one filter of the analog portion based on the speed-up control signal.

23. The method of claim 22, further comprising delaying the input gain control signal and generating a corresponding delayed gain control signal for controlling at least one amplifier of the analog portion.